- 27. A light coupling element as claimed in claim 25, including indentations  $(5, 5_1, 5_2)$  disposed between the elevations  $(7, 7_1, 7_2)$  and being substantially of equal depth.
- 28. A light coupling element as claimed in claim 24, wherein the indentations (5<sub>1</sub>, 5<sub>2</sub>) are linear.
- 29. A light coupling element as claimed in claim 25, wherein the elevations  $(7_1, 7_2)$  are linear.

;;

- 30. A light coupling element as claimed in claim 24, wherein the first and further sets of indentations  $(5_1, 5_2)$  are linear and intersect at right angles and the distances  $(d_0)$  of successive equidistantly parallel indentations  $(5_1, 5_2)$  are equal.
- 31. A light coupling element as claimed in claim 25, wherein the first abd further sets of elevations  $(7_1, 7_2)$  are linear and intersect at right angles and the distances  $(d_0)$  of successive equidistantly parallel elevations  $(7_1, 7_2)$  are equal.
- 32. A light coupling element as claimed in claim 24, wherein distances ( $d_0$ ) of successive equidistantly parallel indentations ( $5_1$ ,  $5_2$ ) are selected as follows:

 $200 \text{ nm} \le d_0 \le 20000 \text{ nm}.$ 

33. A light coupling element as claimed in claim 24, wherein distances  $(d_0)$  of successive equidistantly parallel indentations  $(5_1, 5_2)$  are selected as follows:

 $40 \text{ nm} \le d_0 \le 4000 \text{ nm}.$ 

34. A light coupling element as claimed in claim 24, wherein distances ( $d_0$ ) of successive equidistantly parallel indentations ( $5_1$ ,  $5_2$ ) are selected as follows:

$$100 \text{ nm} \le d_0 \le 1200 \text{ nm}.$$

35. A light coupling element as claimed in claim 25, wherein distances  $(d_0)$  of successive equidistantly parallel elevations  $(7_1, 7_2)$  are selected as follows:

$$200~nm \, \leq \, d_0^{} \, \leq \, 20000~nm.$$

36. A light coupling element as claimed in claim 25, wherein distances ( $d_0$ ) of successive equidistantly parallel elevations ( $7_1$ ,  $7_2$ ) are selected as follows:

$$40 \text{ nm} \le d_0 \le 4000 \text{ nm}.$$

37. A light coupling element as claimed in claim 25, wherein distances ( $d_0$ ) of successive equidistantly parallel elevations ( $7_1$ ,  $7_2$ ) are selected as follows:

$$100 \text{ nm} \le d_0 \le 1200 \text{ nm}.$$

38. A light coupling element as claimed in claim 24, wherein the distances ( $d_0$ ) of successive equidistantly parallel indentations ( $5_1$ ,  $5_2$ ) relative to the selected wavelength  $\lambda$  in air are selected as follows:

$$0.1 \lambda \leq d_0 \leq 10 \lambda$$
.

39. A light coupling element as claimed in claim 24, wherein the distances ( $d_0$ ) of successive equidistantly parallel indentations ( $5_1$ ,  $5_2$ ) relative to the selected wavelength  $\lambda$  in air are selected as follows:

$$0.2 \lambda \leq d_0 \leq 2 \lambda$$
.

40. A light coupling element as claimed in claim 24, wherein the distances ( $d_0$ ) of successive equidistantly parallel indentations ( $5_1$ ,  $5_2$ ) relative to the selected wavelength  $\lambda$  in air are selected as follows:

$$0.5~\lambda \, \leq \, d_0 \, \leq \, 0.6~\lambda.$$

41. A light coupling element as claimed in claim 25, wherein the distances ( $d_0$ ) of successive equidistantly parallel ( $7_1$ ,  $7_2$ ) relative to the selected wavelength  $\lambda$  in air are selected as follows:

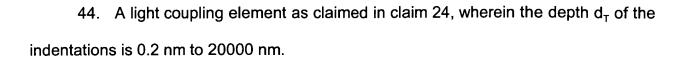
$$0.1 \lambda \leq d_0 \leq 10 \lambda$$
.

42. A light coupling element as claimed in claim 25, wherein the distances ( $d_0$ ) of successive equidistantly parallel ( $7_1$ ,  $7_2$ ) relative to the selected wavelength  $\lambda$  in air are selected as follows:

$$0.2 \ \lambda \leq d_0 \leq 2 \ \lambda.$$

43. A light coupling element as claimed in claim 25, wherein the distances (d<sub>0</sub>) of successive equidistantly parallel (7<sub>1</sub>, 7<sub>2</sub>) relative to the selected wavelength  $\lambda$  in air are selected as follows:

$$0.5 \lambda \le d_0 \le 0.6 \lambda$$
.



- .45. A light coupling element as claimed in claim 24, wherein the depth  $d_{\text{T}}$  of the indentations is 10 nm to 400 nm.
- 46. A light coupling element as claimed in claim 24, wherein the depth  $d_T$  of the indentations relative to the selected wavelength  $\lambda$  in air is selected as follows:

$$0.001~\lambda \, \leq \, d_T \, \leq \, 10~\lambda.$$

47. A light coupling element as claimed in claim 24, wherein the depth  $d_T$  of the indentations relative to the selected wavelength  $\lambda$  in air is selected as follows:

$$0.01 \ \lambda \leq d_{\tau} \leq \lambda.$$

48. A light coupling element as claimed in claim 24, wherein the depth  $d_T$  of the indentations relative to the selected wavelength  $\lambda$  in air is selected as follows:

$$0.05~\lambda \leq d_T \leq 0.2~\lambda.$$

49. A light coupling element as claimed in one of claim 24, wherein a duty cycle, defined as the ratio of elevation width to the distance of successive indentations, is selected to be 0.2 to 0.8.

- 50. A light coupling element as claimed in one of claim 24, wherein a duty cycle, defined as the ratio of elevation width to the distance of successive indentations, is selected to be 0.4 to 0.6.
- 51. A light coupling element as claimed in claim 25, wherein a duty cycle, defined as the ratio of elevation width to the distance of successive elevations, is selected to be 0.2 to 0.8.
- 52. A light coupling element as claimed in claim 25, wherein a duty cycle, defined as the ratio of elevation width to the distance of successive elevations, is selected to be 0.4 to 0.6.
- 53. A light coupling element as claimed in claim 24, wherein the surface (3) is the surface of a layer system (1a) with at least one layer which is applied onto a support (15).
- 54. A light coupling element as claimed in claim 51, wherein the surface of the support (15) in the region has the same indentation structure as the surface of the layer system (1a) and that, in top view, the structures are aligned one on another.
- 55. A light coupling element as claimed in claim 51, wherein the material of the support (15) has a refractive index for the light of the selected wavelength ( $\lambda$ ) which is lower than the refractive index of a layer material of the layer system.
- 56. A light coupling element as claimed in claim 51, wherein the layer system has at least one layer of a high-refractive material.

- 57. A light coupling element as claimed in claim 54, wherein the high-refractive material is at least one of the following materials: Ta<sub>2</sub>O<sub>5</sub>, TaO<sub>2</sub>, NbO<sub>5</sub>, ZrO<sub>2</sub>, ZnO, HfO<sub>2</sub>.
- 58. A light coupling element as claimed in claim 51, wherein the layer system has a thickness  $d_s$  of 2 nm to 20000 nm.
- 59. A light coupling element as claimed in claim 51, wherein the layer system has a thickness  $d_{\rm s}$  of 20 nm to 4000 nm.
- $60.\,\,$  A light coupling element as claimed in claim 51, wherein the layer system has a thickness  $d_s$  of 40 nm to 600 nm.
- 61. A light coupling element as claimed in claim 51, wherein the layer system has a thickness  $d_s$  of 150 nm.
- 62. A light coupling element as claimed in claim 51, wherein the layer system, relative to the selected wavelength  $\lambda$  in air, has a thickness d<sub>s</sub> for which, relative to the selected wavelength  $\lambda$ , in air applies:

$$0.01~\lambda \leq d_{s} \leq 10~\lambda.$$

63. A light coupling element as claimed in claim 51, wherein the layer system, relative to the selected wavelength  $\lambda$  in air, has a thickness d<sub>s</sub> for which, relative to the selected wavelength  $\lambda$ , in air applies:

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$$0.01 \ \lambda \le \ d_{s} \le 2 \ \lambda.$$

64. A light coupling element as claimed in claim 51, wherein the layer system, relative to the selected wavelength  $\lambda$  in air, has a thickness d<sub>s</sub> for which, relative to the selected wavelength  $\lambda$ , in air applies:

$$0.2~\lambda \leq d_{S} \leq 0.3~\lambda.$$

- 65. A light coupling element as claimed in claim 25, wherein the surface (3) is the surface of a layer system (1a) with at least one layer, which is applied onto a support (15).
- 66. A light coupling element as claimed in claim 63, wherein the surface of the support (15) in the region has the same elevation structure as the surface of the layer system (1a) and that, in top view, the structures are aligned one on another.
- 67. A light coupling element as claimed in claim 63, wherein the material of the support (15) has a refractive index for the light of the selected wavelength ( $\lambda$ ) which is lower than the refractive index of a layer material of the layer system.
- 68. A light coupling element as claimed in claim 63, wherein the layer system has at least one layer of a high-refractive material, preferably of at least one of the following materials: Ta<sub>2</sub>O<sub>5</sub>, TaO<sub>2</sub>, NbO<sub>5</sub>, ZrO<sub>2</sub>, ZnO, HfO<sub>2</sub>.
- 69. A light coupling element as claimed in claim 63, wherein the layer system has a thickness  $d_s$  of 2 nm to 20000 nm.

70. A light coupling element as claimed in claim 63, wherein the layer system has a thickness d<sub>s</sub> of 20 nm to 4000 nm.

71. A light coupling element as claimed in claim 63, wherein the layer system has a thickness d<sub>s</sub> of 40 nm to 600 nm.

- 72. A light coupling element as claimed in claim 63, wherein the layer system has a thickness  $d_s$  of 150 nm.
- A light coupling element as claimed in claim 63, wherein the layer system, relative to the selected wavelength  $\lambda$  in air, has a thickness  $d_{\text{S}}$  for which, relative to the selected wavelength  $\lambda$ , in air applies:

$$0.01 \lambda \leq d_S \leq 10 \lambda$$
.

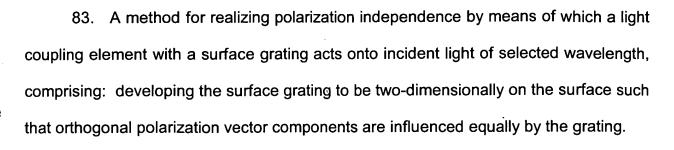
A light coupling element as claimed in claim 63, wherein the layer system, relative to the selected wavelength  $\lambda$  in air, has a thickness d<sub>s</sub> for which, relative to the selected wavelength  $\lambda$ , in air applies:

$$0.01 \ \lambda \le \ d_s \le 2 \ \lambda.$$

A light coupling element as claimed in claim 63, wherein the layer system, relative to the selected wavelength  $\lambda$  in air, has a thickness d<sub>s</sub> for which, relative to the selected wavelength  $\lambda$ , in air applies:

$$0.2~\lambda \, \leq \, d_{_{S}} \, \leq \, 0.3~\lambda.$$

- 76. A light coupling element as claimed in claim 24, including elevations (7) between the equidistantly parallel indentations  $(5_1, 5_2)$  in top view being rhomboid, rhombus, rectangular or square.
- 77. A light coupling element as claimed in claim 25, including indentations (5) between the equidistantly elevations  $(7_1, 7_2)$  in top view being rhomboid, rhombus, rectangular or square.
- 78. A light coupling element as claimed in claim 25, including indentations (5) between the parallel elevations  $(7_1, 7_2)$  in top view being circular or elliptic.
- 79. A light coupling element as claimed in claim 24, on an optical analysis platform for substance analyses.
- 80. A light coupling element as claimed in claim 25, on an optical analysis platform for substance analyses.
- 81. A light coupling element as, claimed in claim 24 in combination with a telecommunication data transmission apparatus.
- 82. A light coupling element as claimed in claim 25 in combination with a telecommunication data transmission apparatus.





84. A method for reducing a drop size on a light coupling element with surface grating, comprising: providing a surface grating extending in two dimensions so that the drop size developing thereon is reduced. –